

Serial No. 10/699,416
Amendment Under 37 CFR §1.116
Response to Final Rejection dated May 3, 2007

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REMARKS/ARGUMENTS

Reconsideration and withdrawal of the rejections set forth in the above-identified Final Rejection, and entry of this Amendment, are respectfully requested.

Upon entry of this Amendment, there would be presently pending claims 1, 3, 5-12, 14, 16-22 and 25-30, 32 and 33. Applicants respectfully submit that all of the claims are patentable and should be allowed.

By this Amendment, in order to advance the prosecution the features of claim 2 have been included in claim 1, so that amended claim 1 is claim 2 rewritten in independent form. Claim 2 has accordingly been canceled without prejudice. Likewise to advance the prosecution, the features of claim 13 have been included in claim 12, so that amended claim 12 is claim 13 rewritten in independent form. Claim 13 has also been canceled without prejudice. In addition, to advance the prosecution the features of claim 31 have been incorporated into claim 29, so that amended claim 29 is claim 31 rewritten in independent form. Claim 31 has likewise been canceled without prejudice. In addition, also to also advance the prosecution claim 34 has been canceled without prejudice. Also, a minor typographical error in claim 30 has been corrected.

Attached hereto is a Supplemental Declaration under 37 CFR §1.132 of Sheldon Kavesh, with is discussed in detail below.

Certain claims were provisionally rejected on the ground of obviousness-type double patenting over claims 1-3 and 5-7 of copending application Serial Number

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11/205,952. This rejection was provisionally made as the referenced application has not issued as a patent.

Applicants respectfully submit that the present claims are clearly patentable over the cited claims of the copending application and therefore request that such rejection be withdrawn. It is noted that the referenced application was filed subsequent to the filing of the subject application. Applicants respectfully submit that no double patenting currently exists as no application has issued, and that a clear line of demarcation between the claims of both applications will be maintained. So far, no claims have been allowed in either application. If necessary, Applicants may submit a terminal disclaimer in the other, later-filed application, to obviate any remaining double patenting rejection as per the MPEP.

In the Final Rejection, claims 1-3, 5-14, 16-22 and 34 were rejected under 35 USC §103 (a) based on Kavesh et al. ("Kavesh") in view of several other patents, namely Maurer et al. ("Maurer"), van Breen et al. (van Breen), and Suwanda et al. ("Suwanda"). This rejection is most respectfully traversed.

It was stated in the Final Rejection that Kavesh discloses all of the claimed process features, with the following exceptions:

(a) a tube length of 1.5 m in Example 533 (which is a multi-filament fiber example). It was held that it would have been obvious to use the 1.5 m tube length disclosed at col. 7, line 28 of Kavesh (which is for single filament fibers) in Example 533 of Kavesh, it being stated that it is a suitable tube length for stretching.

(b) a tube length of 1 m in Example 533. It was considered that it would have been obvious to use an oven length of 1 m of Maurer (col. 6, lines 58-60) in the process

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of Kavesh because Maurer teaches a stretching oven length for successful practice of stretching polyethylene.

(c) the use of an air oven. Although Kavesh teaches using nitrogen, it was stated that van Breen teaches stretching in an oven that is either nitrogen or air (col. 4, lines 5-9), and it was concluded that it would have been obvious to combine the teachings of van Breen and Kavesh because both are suitable environments for stretching.

(d) the use of forced air. It was stated that Suwanda teaches drawing yarn in a forced air convection oven wherein the air is in a turbulent state (emphasis added), with reference being made to col. 7, lines 16-21. It was concluded that it would have been obvious to combine Suwanda's use of a forced air convection oven in the process of Kavesh in order to control the air temperature.

(e) with respect to the feature of claim 2 (now in claim 1), the mass throughput of Kavesh in Example 533 was calculated to be 0.06 g/min, which is outside the scope of claim 1. However, it was considered that since Kavesh teaches production of yarns up to 240 filaments, the mass throughput of the 240 filament yarn calculated (assuming a straight line relationship) would be 0.3 g/min and thus within the range of the claimed feature.

(f) with respect to claim 12, the length of the tube of 1.5 m is considered to be obvious for the same reasons as in (a) above. The rejection relies upon Example 529 of Kavesh with respect to the stretch ratio and other process conditions, but refers to use of a tube length of 1.5 m in Example 533.

(g) with respect to claim 12, the tube length of 1 m is also considered to be obvious from the teaching of Maurer, similar to (b) above.

(h) with respect to the feature of claim 13 (now in claim 12), the mass throughput of Kavesh in Example 529 was calculated to be 0.053 g/min, which is outside the scope of the claim. However, it was considered that since Kavesh teaches production of yarns up to 240 filaments, the mass throughput of the 240 filament yarn calculated (assuming a

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straight line relationship) would be 0.31 g/min and thus within the range of the claimed feature.

Also in the Final Rejection, claims 25-33 were also rejected under 35 USC §103 (a) based on the same combination of references used against claim 1, as well as Bory et al. ("Bory").

These rejections are most respectfully traversed, and their withdrawal is most respectfully requested.

Reference is made to the arguments presented in the previous Amendments, to which the Examiner's attention is respectfully directed. Rather than repeat those arguments, it is believed that it would be helpful if the comments in the Final Rejection regarding the alleged failures of Applicants' arguments and evidence were responded to.

I. Comments Directed to the Previously Submitted Declaration

1. With regard to first paragraph A) on page 14 of the Final Rejection (there being two paragraphs A) on that page), the comment was made that the previous Declaration only used a single temperature (151 °C) for the Prandtl Number that was used to calculate the ratio of turbulent to laminar Nusselt numbers. This was stated as not being commensurate in scope with the claims which call for a temperature range of 130 to 160 °C.

In response thereto, in the attached Supplemental Declaration (Paragraph 1) of Dr. Kavesh he calculates in the Appendix to the Declaration the ratio of turbulent to laminar Nusselt numbers using Prandtl Numbers for temperatures of 130, 145 and 160 °C. It can

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be seen that the ratios are essentially the same over the entire claimed range of 130 to 160 °C. Thus, Dr. Kavesh concludes that the heat transfer coefficient is at least about an order of magnitude lower in a laminar flow regime than in a turbulent flow regime over the entire temperature range claimed. Accordingly, it is respectfully submitted that this criticism of the prior Declaration has been overcome.

2. With regard to the second paragraph A) on page 14 of the Final Rejection, it was stated in the Final Rejection that drawing of a PE yarn in turbulent air is taught by Suwanda, with reference also being made to Perry's Handbook, page 10-14. At page 5, last paragraph of the Final Rejection, as well as elsewhere, it was stated that Suwanda teaches drawing yarn in an air oven, "wherein the air circulation in said oven is in a turbulent state" (emphasis added), with reference to col. 7, lines 16-21. However, it is respectfully pointed out that there is nothing in Suwanda at the cited location or elsewhere in that patent in which the oven air flow is disclosed or suggested as being "turbulent". The conclusion of Dr. Kavesh in his earlier Declaration was said to be given appropriate weight as opinion evidence.

In the Supplemental Declaration of Dr. Kavesh, this point is further addressed in Paragraph 2. Dr. Kavesh makes reference to pages 10-14 and 10-15 of Perry's, with the latter stating that "Normally laminar flow occurs in closed ducts when ..." the Reynolds number is below a certain amount. Dr. Kavesh states that Suwanda does not provide information as to whether the forced air flow in oven 26 is in the turbulent or laminar flow regime. Dr. Kavesh concludes that Suwanda does not teach turbulent flow as that term is not used or suggested in the reference.

It is also pointed out that in Paragraph 14) on page 19 of the Final Rejection it was stated that "Perry's provides evidence that most of a forced air is turbulent" (emphasis added). However, what Perry's actually states at the cited location is that "Flow is generally turbulent..." (emphasis added). It is respectfully submitted that when

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Perry's speaks about "generally turbulent" this cannot be properly interpreted as suggesting "mostly turbulent" as has been done in the Final Rejection.

3. With regard to paragraph B) on page 14 of the Final Rejection, it is stated that appropriate weight was given to the opinion evidence, but the rejection further states that if slowed the productivity of the process of the Kavesh patent would still exceed the claimed amount of 0.25 g/min.

The basis for this conclusion appears to be that there is a linear relationship between the number of filaments and the mass throughput; and that although data is only given for 48 filaments in Example 533 of the Kavesh patent, the disclosure elsewhere in that patent of the production of yarns of 16, 120 and 240 filaments would lead to a calculation using the 240 filament number that is within the claimed range. Dr. Kavesh's previous Declaration stated his opinion that such relationship cannot be assumed to be linear.

In his Supplemental Declaration at Paragraph 3, Dr. Kavesh further expands on this point. In addition to his opinion, Dr. Kavesh attaches a data sheet for a high strength polyethylene fiber. Dr. Kavesh points out that the yarn tenacity for comparable products decreased from 30.5 to 22.5 g/d as the number of filaments/tow (filaments/yarn end) increased from 60 to 480. Dr. Kavesh states that the fact that the tenacity decreased as filament count increased indicates that it was necessary to run the higher filament count yarns at lower final line speeds. Such lower line speeds mean that the mass throughput did not increase in simple proportion to the filament count. Dr. Kavesh makes similar comments with reference to the Bory patent and the calculation made in the Final Rejection about the mass throughput using the disclosure of Bory.

Accordingly, it is respectfully submitted that this critique of Dr. Kavesh's previous Declaration has been rebutted. Dr. Kavesh concludes in his Supplemental Declaration that there is nothing to support the statement in the Final Rejection that even

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slowing down the process of Example 533 would still yield a scaled up production rate for 240 filaments of 0.25 g/min.

4. With regard to the comment in Paragraph C) on page 15 of the Final Rejection, Dr. Kavesh further explains in Paragraph 4 of his Supplemental Declaration that higher draw ratios in Example 523 were not possible. When stretch ratios greater than 10/1 were reached the yarn broke and hence ratios above this number cannot be considered to be possible. Thus, it was not possible to obtain higher feed yarn tenacities in Examples 529 and 533 of the Kavesh patent.

5. Dr. Kavesh also comments on the conclusions set forth in the paragraph bridging pages 12 and 13 of the Final Rejection. Besides some confusion as to whether Example 529 or 533 is being referred to, Dr. Kavesh states that feed yarn of Example 529 was previously drawn in Example 523. Thus, the conclusion at Page 13 of the Final Rejection that any subsequent drawing would destroy the fiber is not accurate.

Dr. Kavesh further calculates the mass throughput during preparation of the yarn of Example 523 and this was found to be less than what is claimed in claim 29 (from which claim 32 depends).

6. Dr. Kavesh concludes in the Supplemental Declaration that in his opinion the high mass throughputs in the present application were unexpected.

II. Comments Directed to the Arguments in the Final Rejection

1. Length of tube in USP 4,551,296 – in the Final Rejection it was concluded that it would be obvious to use a tube of 1.5 m in Example 533 of USP 4,551,296 because a

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tube length of that amount is employed in another section of the Kavesh patent. However, as pointed out above the disclosure of the Kavesh patent is for a single filament yarn rather than for a multifilament yarn as in Example 533, and it is submitted that there is nothing in the record to suggest that the same oven length could be employed in the stretching of multifilament yarns as is done for single filament yarns.

Maurer was relied upon as teaching a stretching oven of 1 m. However, as previously pointed out Maurer is submitted to be non-analogous art since it is directed to a filled polyethylene fiber, with the filler employed to enhance physical properties of the fiber. Moreover, Maurer only discloses the length of the oven in Example 1, which is directed to a single filament process as opposed to the multifilament process of Example 533 of the Kavesh patent. As such, it is respectfully submitted that Maurer is not properly combinable with the Kavesh patent. Thus, the calculation of the value of the third equation of claim 1 is not met.

2. Stretching of PE fiber in air – it is recognized in the Final Rejection that the Kavesh patent does not disclose stretching of high molecular weight PE fibers in air. Rather, nitrogen is employed in that patent. The van Breen patent was cited for suggesting stretching in air. However, it is respectfully submitted that van Breen is non-analogous art since it is directed to a process of producing fibers from an alternating copolymer of an olefinically unsaturated compound and carbon monoxide (e.g., ethylene/CO copolymer). It is respectfully submitted that one having ordinary skill in the art would not combine the teachings of van Brcen with that of the Kavesh patent as modified by Maurer since the former is directed to E/CO type of polymer fibers and the latter is directed to high molecular weight polyethylene fibers.

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In the Final Rejection, it is concluded that van Breen is analogous art since it is also broadly directed to stretching in air. However, it is submitted that this is not the proper test since there is nothing in the Kavesh patent to suggest that stretching in air would be desirable. Furthermore, to consider van Breen to be analogous art just because it is related to stretching is likewise submitted to be an improper standard since then the stretching of any and all fibers (or for that matter, films) of any plastic material would then be considered analogous art. This is and should not be the proper test to determine whether a reference is in a related art so that its teachings are combinable with another reference's teachings.

3. Stretching of PE fiber in a turbulent forced air oven – The Suwanda patent is being relied upon for teaching stretching in a forced air oven. It was considered in the Final Rejection that Suwanda is analogous art since it is also broadly directed to stretching polyethylene. Firstly, Applicants respectfully submitted that Suwanda is not analogous art since it is directed to cross-linked polyethylene. Secondly, as pointed out above although Suwanda may suggest a forced air oven, it does not disclose or suggest an oven in which the air is in a turbulent state as claimed in all of the independent claims of this application. There is nothing in the disclosure at column 7, lines 14-21 of Suwanda that is relied upon in the Final Rejection that suggests using turbulent air flow. Thus, even if the combination of references were considered to be proper, this claimed feature would still not be present.

The reference to Perry's Handbook regarding forced air flow has been addressed in the above comments with respect to the Supplemental Declaration. In addition, it is noted that Perry's Handbook is not a reference that has been formally used in the rejection of the claims.

4. Mass throughput – as mentioned above, the independent claims all call for the

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mass throughput of the process of the invention to be above a specified amount. It is respectfully submitted that none of the applied references discloses a process with the mass throughputs as claimed herein. It is only through the use of an improperly assumed relationship that a rejection of the claims is made in the Final Rejection. There is nothing in the cited prior art to suggest that there is a linear relationship between the mass throughput and the number of filaments, and indeed the Supplemental Declaration of Dr. Kavesh has shown otherwise.

With respect to the claims that call for the mass throughput of at least 0.25 g/min, the Kavesh patent is relied upon, and its shortcomings in this area have been discussed above. For certain claims of this application which call for higher mass throughputs than calculated from the Kavesh patent alone in the Final Rejection, there is reliance on the disclosure of Bory.

Bory is directed to a spinneret assembly that is used to spin fibers. There is absolutely nothing in the Bory patent that suggests that their teaching is useful in the spinning of high molecular weight polyethylene fibers, to which the process of the Kavesh patent is directed. The only specific fiber material mentioned in Bory is acrylic fibers, which are mentioned in the examples of that patent. It is respectfully submitted that Bory is clearly not analogous to the polyethylene fiber process of the Kavesh patent. It is also submitted that there is no teaching or suggestion in the applied prior art that would lead one having ordinary skill in the art to combine a teaching of a spinneret assembly for use with acrylic fibers to modify the process conditions of a patent that is directed to polyethylene fibers.

In the Final Rejection of claims 25-29, the supposed linear relationship of the mass throughput to the number of filaments is taken to the extreme by the assumption in the calculation that this relationship also applies to yarns of 3750 filaments (as is said to

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be disclosed in Bory). It is respectfully submitted that there is a gigantic leap from the maximum number of filaments (240) disclosed in the Kavesh patent (that was relied on for the calculation with respect to the other claims) to the number of filaments (3750) that is being relied upon to support a rejection over Bory. The number of filaments suggested in Bory is over 15 times that of the maximum in the Kavesh patent. It is respectfully submitted that there is nothing in the applied prior art to suggest that Bory should be combined with the modified teaching of the Kavesh patent, and even if so combined that to assume that the supposed linear relationship remains constant despite the enormous difference in the number of fibers.

III. Summary

In summary, Applicants respectfully submit that the combination of references as applied does not establish the obviousness of the claimed invention. For example, the calculation based on the assumption of a linear relationship between the number of filaments and the mass throughput, the conclusion that there is turbulence in the oven of Suwanda, and the assumption of the length of the tube in Examples 529 and 533 of USP 4,551,296 are all not supported by the evidence and are submitted to be insufficient to establish obviousness of the claimed invention. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955 1957 (Fed. Cir. 1993) and *In re Robertson*, 169 F.3d 743, 745 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999).

It is respectfully submitted that the rejection of all of the claims has been rebutted by the Supplemental Declaration of Dr. Kavesh, the above remarks, the previous Declaration of Dr. Kavesh and the previous remarks. It is submitted that even if all of the references of record were properly combinable, the claimed invention would still not be shown, at least due to the missing feature of the claimed mass throughputs.

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Therefore, Applicants respectfully request that the rejections of the claims be reconsidered. When so reconsidered, it is believed that the claims should be found to be allowable. Consequently, entry of this Amendment and the attached Supplemental Declaration, reconsideration of the rejections, and allowance of the application are most respectfully solicited. Early notification to that effect is earnestly solicited.

Alternatively, entry of this Amendment and attached Supplemental Declaration for purposes of appeal is respectfully requested as the issues on appeal would be significantly reduced.

Should the Examiner believe that a telephone discussion would in any way be of assistance, he is respectfully requested to telephone the undersigned.

Respectfully submitted,
Thomas Y-T. Tam et al.

By: Roger H. Criss
Roger H. Criss
(Their Attorney)
Reg. No. 25,570
(239) 254-0971

Attachment

Roger H. Criss
1462 Via Portofino
Naples, FL 34108